

International Seminar of Ecology – 2022

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Europe's first conference on the environment was held in 1970 in Menton, France. This event was organized by Alfred Hassler on behalf of the “Fellowship of Reconciliation” (a pacifist and civil rights organization, <https://forusa.org/>) together with other leading intellectuals. The forum conceived and issued the so-called Menton Message which was further signed by two thousand, two hundred scientists and displayed at the 1972 United Nations Conference on the Human Environment in Stockholm (Ivanova and Lele 2022). This statement was one of the earliest examples of a collective public alert by scientists demanding a societal change to cope with the environmental crisis and the nuclear weapons race that could lead to destruction of life on Earth. Numbering 3.5 billion people at the time of the Menton Message act, today, more than fifty years later, the World's population has reached an impressive count of 8 billion. The “Stockholm+50: a healthy planet for the prosperity of all – our responsibility, our opportunity” summit was held in June, 2022 (<https://www.stockholm50.global/>) as a historical legacy of the 1972 United Nations Conference on the Human Environment. Participants in the summit concluded that, despite the over five decades of efforts to restrain the damage of environmental threats, environmental challenges had even evolved deeper in their complexity and global impact. Humankind has reached the point of facing “a triple planetary crisis of climate change, biodiversity loss and pollution”. These factors were recognized as a major prerequisite for hampering mankind's sustainable development, leading to poverty and the spread of diseases. The persistence of this crisis was cited as bringing our Planet to “tipping points beyond which there would be little chance of recovery” (Savisaar 2022).

The “Seminar of Ecology” is an annual event, held in Sofia, Bulgaria, since 2007 with the main purpose of alerting the Bulgarian scientific community about the latest ecological concerns arising in the country and suggesting scientifically based decisions to solve them. The first Seminar was co-organized by Section Biology at the Union of Scientists, Bulgaria and the Central Laboratory of General Ecology, Bulgarian Academy of Sciences (Chankova 2022). The fruitful communication of Bachelor, Master, PhD- students and young researchers with established scientists with lengthy expertise in the diverse aspects of ecology, has strengthened the traditions of the “Seminar of Ecology” as a regular meeting point and an annual scientific forum throughout the years. Outstanding oral presentations and poster contributions of young researchers have been selected and awarded at the event. Full-text contributions presented at the event have been peer-reviewed and published in the Proceedings Book. Selected full-text contributions of the last three years of the “Seminar of Ecology” have been published in the journals *Ecologia Balkanica*, *BioRisk*, and *Phytologia Balcanica*.

The event has also gained popularity beyond the borders of Bulgaria with researchers from abroad also presenting their latest results. In 2014 the event became the “Seminar of Ecology with international participation” and an “International Seminar of Ecology” in 2019.

The current special issue entitled “Actual problems of Ecology” consists of selected eleven full-text contributions presented at the “International Seminar of Ecology” in 2022. The event was held online on 29–30 September and was dedicated to “The International Year of Basic Sciences for Sustainable Development 2022”. Contributions comprised four scientific topics.

In a plenary lecture in the first thematic topic “Biotic and abiotic impact on the living nature. Ecological risk. Bioremediation”, Chankova et al. (2023) opened the discussion by focusing on the ecological, agricultural and medical aspects of genotype resistance to oxidative stress. The role of chaperone proteins in DNA repair, a topic not so widely discussed in literature, was addressed and systematized in the current special issue as a review paper. The session continued with two further lectures. The first was dedicated to the bacterial and fungal diversity in the long-term copper (Cu) contaminated soils of the highly industrialized zone of Topolnitsa-Pirdop valley where a number of mines and processing plants for copper and other non-ferrous metals long-term are found (Petkova et al. 2023). In their lecture Todorova et al. (2023) investigated the role of genotype for coping with PbCl_2 induced stress in model systems of *Chlamydomonas reinhardtii* strain 137C – wild type, *Saccharomyces cerevisiae* strain D7ts1 and *Pisum sativum* L. cultivar Ran1. The experiment allowed for elucidating the mechanism of oxidative stress induction caused by PbCl_2 on the DNA molecule and photosynthetic pigments. Three of the posters presented in the session of the first thematic topic of the Seminar and published in the special issue include the works of Georgieva et al. (2023a), Peteva et al. (2023) and Angelova et al. (2023). In the first of these contributions authors have evaluated the presence and characteristics of microplastic particles in waters from the Black Sea coast of Bulgaria (protected, aquaculture

and industrial areas were compared). Peteva et al. (2023) investigate the content of hydrophilic and lipophilic marine toxins in plankton samples taken in 2021 along the whole Bulgarian coastline, and have compared their results with those from the previous period. The third poster in the first scientific topic of the Seminar published as a full text studied the physiological response of human erythrocytes subjected to *in vitro* irradiation by magnetic field of high frequency (2.41 GHz) (Angelova et al. 2023). The second thematic session “Ecological agriculture. Ecological education” of the Seminar is represented by the oral presentation of Ilinkin et al. (2023) and two poster contributions by young researchers (Georgieva et al. 2023b; Kirov et al. 2023). In their study, Ilinkin et al. (2023) investigate the potential for *in vitro* propagation and *ex vitro* adaptation of *Tanacetum cinerariifolium* (Trevir.) Sch. Bip. (Dalmatian pyrethrum, Asteraceae). The study was motivated by the necessity to obtain a stable system for the vegetative propagation of the species, providing for a reliable and constant supply of elite planting material with a high capacity for pyrethrins production. Georgieva et al. (2023b) studied the effects of growth promoting rhizobacteria strain *Pseudomonas putida* 1046 on the germination of corn seeds. Kirov et al. (2023) investigated the accumulation of potentially harmful feed ingredients in hen eggs albumen with special attention to metal traces. The authors have presented the results of a comparative survey of metal content in egg albumen in industrial poultry farms with that of backyard and free-range hens. In the experiment, the contents of heavy metals were analyzed - Cr, Cu, Fe, Mn and Zn; Al, Cd, Ni and Pb, as well as B, Ba, Sr, Ca and Mg. The poster was awarded first place in the Young Researchers’ Contest at the Seminar. The third thematic session “Biodiversity. Conservation biology” has been presented in the current issue by the work of Spasova et al. (2023) who study the plant communities and their utilization by mammals of two peat-shrub species habitats – those of *Spiraea salicifolia* and *Potentilla fruticosa* (boreal relicts among dominant coniferous forests) in the Rhodope Mountains. The fourth thematic session “Ecosystem research and services. Landscape ecology” comprises the oral presentation of Grigorov et al. (2023) and deals with the forest habitat diversity of Godech Municipality according to the EUNIS habitat classification.

The “Seminar of Ecology 2022” was the second consecutive forum, held online in the yearly history of the event. Nevertheless, the dynamics of discussions and scientific interest of the audience towards the research of the diverse range of presenting authors was well reflected.

Thus, issues of major concern regarding the impact of human activities on the vital characteristics of ecosystems of different types were brought forward. Alerts were raised that the threats of the “triple planetary crisis of climate change, biodiversity loss and pollution” have been evidenced to affect diverse living systems on the micro- and macroscale. The “Seminar of Ecology – 2023”, entitled “Cutting Edge Research of Ecology” has been planned as a hybrid event to take place both face-to-face and online in Sofia, September 28th–29th with the prospect of providing the opportunity to deepen research already initiated, as well as to search for scientifically based solutions to the problems identified.

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